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Belt Line directly into the exposition grounds. When foreign exhibits reach San Francisco bay by steamer they are barged to the exposition freight ferry slip.

IN Virginia there are 700 school and civic leagues organized in the country school districts by the Cooperative Education Association, which is a citizens' organization working in conjunction with the State Department of Education. A school and civic league is "a social club, school betterment association and chamber of commerce set down in a country neighborhood and holding its meetings in the schoolhouse. Officers are elected, meetings are held monthly or fortnightly, and the teacher is a leading spirit in all activities." It is a means of community education for practical citizenship adapted to rural conditions and needs. In addition to musicals, spelling bees, and other social activities, discussion and debate of public questions, primarily of local interest, occupy the meetings. The Cooperative Education Association sends to each league programs on such questions as health, good roads and better farming. A home reading course has been established, based on a text-book on some rural subject and supplemented by bulletins from the several state departments and from the College of Agriculture. Upon the completion of the course members are awarded certificates. The civic training afforded by the leagues comes largely, however, through activity in behalf of better community conditions. One league last year raised \$2,500 for the improvement of the roads leading to the school, and this year the good roads meeting held in a one-room school started a movement for an automobile road over 100 miles in length. The improvement of the school itself is, of course, one of the chief interests of the leagues. In 1912-13 they collectively raised \$65,000 which was expended for libraries, pictures, pianos, window shades and other improvements. In a sparsely settled section of Charles City County, which until a year ago had no school facilities, a league was formed, an old farm building was rented and furnished with a few chairs and a table, and the school trustees were requested

to supply a teacher. Interest increased and finally a model one-room school building was erected, partly by public funds and partly by money raised by the league. Many high schools in Virginia have been built in just this way.

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#### UNIVERSITY AND EDUCATIONAL NEWS

THE corporation of Yale University has approved plans for the new pathological laboratory of the Medical School, in connection with the New Haven Hospital. This building is to be called the Anthony N. Brady Memorial, and is a gift of members of the Brady family.

THE Baltimore Association for the Promotion of the University Education of Women again offers a fellowship of \$600 for the year 1915-16 available for study at an American or European university. Applications must be in the hands of Dr. Mary Sherwood, chairman of the committee on award, before January 1, 1915.

THE trustees of Princeton University have increased the tuition for regular students from \$160 to \$175 a year, beginning September, 1915. The remission of tuition which is granted to needy students has been increased from \$100 to \$115.

BEGINNING this autumn only the degree of bachelor of arts will be awarded to students of the college of the University of Pennsylvania, the degree of bachelor of science in the arts course having been discontinued.

PROFESSOR A. N. WINCHELL, of the University of Wisconsin, is trying the experiment of teaching the microscopic study of minerals and rocks by correspondence, under the auspices of the Extension Division of the University. Each student must be equipped with his own petrographic microscope and thin sections.

THE Aix-en-Provence University has invited the Belgian universities to send their faculties and students to Aix, offering to provide free lodging for the students. The university has asked the minister of education for the privilege of granting degrees to the refugee students.

DR. T. E. HODGES, president of the University of West Virginia, has resigned to become a candidate for congressman-at-large.

PROFESSOR JAMES WILLIAM TOUMEY has been elected director of the Yale School of Forestry for five years, in place of Henry S. Graves. Professor Toumey has been acting director during Professor Graves's absence as United States forester.

PROFESSOR M. A. ROSANOFF, for the past seven years director of the department of chemistry in Clark University, has accepted a professorship of chemical research in the Mellon Institute of Industrial Research and the graduate school of the University of Pittsburgh. Dr. Rosanoff's students have resigned fellowships at Clark and have followed him to Pittsburgh.

DR. HOMER F. SWIFT has been appointed associate professor of the practise of medicine in the College of Physicians and Surgeons of Columbia University in succession to Dr. Theodore C. Janeway, now of the Johns Hopkins Medical School.

DR. ALWIN M. PAPPENHEIMER has been appointed professor of pathology in the College of Physicians and Surgeons, Columbia University, to succeed Dr. James W. Jobling, who has become professor of pathology in Vanderbilt University.

In the University of California Dr. Walter Lafayette Howard, since 1905 professor of horticulture in the University of Missouri, has been appointed associate professor of pomology. Dr. Jacob Traum, until recently of the staff of the division of pathology of the Bureau of Animal Industry of the United States Department of Agriculture, has been appointed assistant professor of veterinary science, and will devote his time to investigations in regard to tuberculosis in the domestic animals. Roland S. Vaile, until recently collaborator in the United States Bureau of Entomology, has been appointed assistant professor of orchard management. He will be attached to the Graduate School of Tropical Agriculture at Riverside.

At the Massachusetts Institute of Technology in the department of mechanical engineering, E. W. Brewster and Arthur F. Petts have been named assistants, and Henry M. Wylde, Robert T. Gookin and Walter Haynes, assistants in inorganic chemistry, food analysis and electrical engineering, respectively. Dr. Charles A. Kraus has resigned as assistant professor of physico-chemical research.

#### DISCUSSION AND CORRESPONDENCE

##### EVOLUTION BY SELECTION OF MUTATIONS

HUGO DE VRIES, in his Brussels address delivered last January and printed in *SCIENCE* of July 17, with an annotation by the author replying to a criticism of his theory by Edward C. Jeffrey, objects to evolution by selection of fluctuating variation on the ground that this is too slow a process for the length of geologic time.

He does this without offering any evidence that evolution by selection of mutations would be any faster process. He admits that "it is hardly probable that these jumps are numerous in a state of nature as it now surrounds us."

Is there any more presumption in favor of a more rapid rate for evolution proceeding by jumps separated by long intervals from each other than by evolution proceeding by constant though imperceptible steps?

Until we are in possession of such quantitative data we are not in a position to affirm how much change may or may not take place in organisms in a given period of time.

Croll, I think it was, offered a word of caution here. It was to the effect that no one was in a position to say offhand what might or might not take place in a million years.

It has always seemed to me that Herbert Spencer pretty effectually answered the "not-time-enough objection" to evolution, even by the slow process of imperceptible change in organisms; by a comparison of ontogeny with phylogeny and the drawing of a conclusion in accordance with the simple "rule of three."

Taking the development of man in his individual history of 40 weeks from germ cell to fully developed human being, as an epitome of the development of the animal kingdom